

CHAPTER III

SUMMARY OF TROPICAL CYCLONES OF 1963

The JTWC issued a total of 663 tropical warnings on 19 typhoons, 6 tropical storms, and 3 tropical depressions in the Western Pacific Ocean in 1963. Five additional tropical cyclones were investigated by weather reconnaissance but did not develop significantly to substantiate the issuance of warnings. The spawning of 19 typhoons in the Western Pacific Ocean during 1963 may be considered a normal occurrence as the annual average from 1952-1962 was 18.9.

The following data for the JTWC area of responsibility is presented for comparison:

COMPARATIVE WESTERN PACIFIC TROPICAL CYCLONE DATA

	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>
TOTAL NUMBER OF WARNINGS	583	776	738	815	663
CALENDAR DAYS OF WARNINGS	137	157	165	154	146
SUSPECT CYCLONES	32	26	27	17	5
TROPICAL DEPRESSIONS	7	3	11	9	3
TROPICAL STORMS	9	8	11	6	6
TYPHOONS	17	19	20	24	19
TOTAL TROPICAL CYCLONES	65	56	69	56	33

In the area of responsibility of the Joint Hurricane Warning Center, Hawaii, (North Pacific Ocean between 140W and 180°) there were two cyclones which required tropical depression warnings.

The most intense typhoon of 1963 was Typhoon JUDY (30 Sep-04 Oct). JUDY developed a maximum sustained wind of 150 kts and had a minimum observed sea level pressure of 917mb, minimum 700mb height of 2384 meters and a maximum 700mb temperature of 24°C. In the past, super typhoons, ones with sustained wind speeds in excess of 130 kts, have been observed to have concentric eyes, and JUDY was no exception. At one time, JUDY had two closed rings of wall clouds with a third ring in partial existence. The same features were present with Typhoon KAREN of the 1962 season which obtained a maximum sustained wind speed of 160 kts.

The circulation area of a tropical cyclone will differ from system to system. As evidence of this fact, Typhoons DELLA (25 Aug-30 Aug) and GLORIA (05 Sep-14 Sep) are depicted. DELLA's counterpart may be found in VERA (25 Aug-

28 Aug) of 1962. Both typhoons were approximately the same size, formed in the same area, ESE of Okinawa, and the first warning on each was issued by the JTWC on the same day of the same month.

Typhoon KIT (05 Oct-11 Oct) had the largest surface cyclonic circulation with a maximum radius of curvature of 700 mi. PHYLLIS (12 Dec-13 Dec), a South China Sea cyclone, was the smallest typhoon of 1963 when considering size of circulation area and also had the shortest life of any typhoon during the year. PHYLLIS is the only tropical cyclone on record (1884-1963) which developed and reached typhoon intensity in the South China Sea during the month of December. The persistent northeast monsoons in this area during December account for the non-development of typhoons.

Typhoons GLORIA and LOLA performed cyclonic loops, with GLORIA looping along the Asiatic mainland NW of Taiwan and LOLA W of Guam. Typhoon BESS (27 Jul-11 Aug), even though it did not perform a loop, was considered by JTWC to have the most erratic movement of any of the typhoons of 1963. BESS established an all-time record for the most tropical warnings issued by JTWC with a total of 61 issued over a period of 15 days.

The Fujiwhara effect between LOLA and MAMIE was observed. Both typhoons recurved within the same six-hour time period, MAMIE recurving 300 mi NW of Marcus Island and LOLA recurving 375 mi SW of Iwo Jima.

Typhoon SUSAN (18 Dec-28 Dec) began its development S of 5N and was the only typhoon to begin this far south during the year. Strong surface winds on occasions have been reported to JTWC by island stations near the equator while tropical cyclones are developing. As SUSAN began to develop, Nauru Island, 32 min S 166 deg 55 min E, reported the following surface wind:

180000Z	270 deg 45 kts	190600Z	270 deg 30 kts
180600Z	270 deg 52 kts	191200Z	NO REPORT RECEIVED
181200Z	NO REPORT RECEIVED	191800Z	NO REPORT RECEIVED
181800Z	NO REPORT RECEIVED	200000Z	270 deg 35 kts
190000Z	270 deg 50 kts	200600Z	270 deg 25 kts

Reports were received from Ocean Island, located at 52 min S 169 deg 30 min E, with surface winds reported WNW at 25-35 kts for a time period in excess of 24 hours.

Of the 19 typhoons during 1963, 15 recurved into the westerlies and 4 dissipated over land prior to recurving. Fourteen of the recurving typhoons became extratropical cyclones. Once the tropical cyclone has moved into the westerlies and begins to become extratropical, some or all of the following characteristics may be found:

1. Absence of or dissipating wall clouds
2. No visible eye or precipitation in eye
3. Elongation of circulation pattern or the existence of a cold front in the immediate vicinity of the eye. This situation normally produces thunderstorm activity in the north semicircle of the cyclone with the strongest winds found in the south semicircle.
4. Absence of Cs or As cloud shield
5. Absence of pronounced feeder bands
6. No warm core at 700mb level
7. Clear Air Turbulence in the vicinity of the cyclone. Weather reconnaissance aircraft have reported severe to extreme turbulence on penetrating tropical cyclones as they become extratropical. On several occasions, wind speed has increased for an approximate period of 6 hours and then decreased rapidly thereafter.

It is difficult and many times impossible to say just when a tropical cyclone has become extratropical, but in general, several of the above criteria exist before JTWC declares a tropical cyclone extratropical.

Land areas affected by typhoons during 1963 are listed below:

1. Asiatic Mainland - Typhoons TRIX, WENDY, AGNES, CARMEN, FAYE and GLORIA
2. Babuyan Islands - Typhoons AGNES, FAYE and PHYLLIS
3. Batan Island - Typhoon FAYE
4. Bonin Islands - Typhoons POLLY, DELLA, JUDY, KIT and LOLA
5. Caroline Islands - Typhoon CARMEN
6. Hainan Islands - Typhoons AGNES, CARMEN and FAYE

7. Japan - Typhoons POLLY, SHIRLEY, BESS and DELLA
8. Korea - Typhoons SHIRLEY and BESS
9. Marcus Island - Typhoons OLIVE, ELAINE, MAMIE, ORA and SUSAN
10. Mariana Islands - Typhoons OLIVE, WENDY, JUDY, LOLA and SUSAN
11. Marshall Islands - Typhoon SUSAN
12. Palau Island - Typhoon CARMEN
13. Philippine Islands - Typhoons TRIX, AGNES, FAYE, GLORIA and PHYLLIS
14. Ryukyu Islands - Typhoons SHIRLEY, BESS, DELLA, GLORIA and KIT
15. Taiwan - Typhoons SHIRLEY, WENDY, FAYE and GLORIA
16. Vietnam - Typhoons CARMEN and FAYE

The 24, 48 and 72-hour mean forecast error for each typhoon was computed by two methods. The standard vector error is complemented by a closest-distance error from best track without regard to a given time. It is possible that an error computation giving closest distance from best track will give the user a better understanding of JTWC's capability of forecasting a typhoon to affect a particular area.

The tabulation of the forecast vector error is given for comparison.

FORECAST VERIFICATION
AVERAGE ERROR NAUTICAL MILES

	24 HR	48 HR	72 HR
1950-58	170	--	--
1959	117	267	--
1960	177	354	--
1961	136	274	--
1962	144	287	476
1963	127	246	374

1963 TYPHOON FORECAST VECTOR ERRORS
(IN MI)

TYPHOON	24 HR FORECASTS		48 HR FORECASTS		72 HR FORECASTS	
	NO. OF CASES	MEAN ERROR	NO. OF CASES	MEAN ERROR	NO. OF CASES	MEAN ERROR
OLIVE	34	119	27	288	-	--
POLLY	17	146	12	221	1	320
SHIRLEY	27	158	23	248	3	353
TRIX	17	99	13	198	-	--
WENDY	28	109	24	210	4	362
AGNES	15	136	11	289	-	--
BESS	42	135	38	278	3	364
CARMEN	26	89	21	121	3	143
DELLA	18	109	11	203	1	157
ELAINE	8	130	2	240	-	--
FAYE	23	76	19	131	3	216
GLORIA	28	97	22	181	4	210
JUDY	15	126	11	339	2	337
KIT	23	144	19	400	3	865
LOLA	28	146	23	244	1	840
MAMIE	10	239	6	461	-	--
ORA	11	180	7	222	-	--
PHYLLIS	2	242	--	--	-	--
SUSAN	35	127	28	266	6	433

AVERAGE ERROR - 24 HR FORECASTS (407 CASES).... 127

AVERAGE ERROR - 48 HR FORECASTS (317 CASES).... 246

AVERAGE ERROR - 72 HR FORECASTS (34 CASES).... 374

1963 TYPHOON FORECAST ERRORS (IN MI)
 (IN TERMS OF CLOSEST DISTANCE TO BEST TRACK)

TYPHOON	24 HR FORECASTS		48 HR FORECASTS		72 HR FORECASTS	
	NO. OF CASES	MEAN ERROR	NO. OF CASES	MEAN ERROR	NO. OF CASES	MEAN ERROR
OLIVE	34	82	27	167	-	--
POLLY	17	99	12	81	1	334
SHIRLEY	27	73	23	158	3	254
TRIX	17	53	13	140	-	--
WENDY	28	72	24	146	4	274
AGNES	15	104	11	263	-	--
BESS	42	88	38	176	3	262
CARMEN	26	65	21	96	3	48
DELLA	18	39	11	28	1	95
ELAINE	8	58	2	43	-	--
FAYE	23	49	19	80	3	161
GLORIA	28	61	22	116	4	161
JUDY	15	80	11	245	2	175
KIT	23	102	19	142	3	70
LOLA	28	99	23	155	1	428
MAMIE	10	133	6	216	-	--
ORA	11	102	7	149	-	--
PHYLLIS	2	00	--	--	-	--
SUSAN	35	82	28	102	6	122

AVERAGE ERROR - 24 HR FORECASTS (407 CASES) 79

AVERAGE ERROR - 48 HR FORECASTS (317 CASES) 141

AVERAGE ERROR - 72 HR FORECASTS (34 CASES) 178

1963 TYPHOON DATA SUMMARY

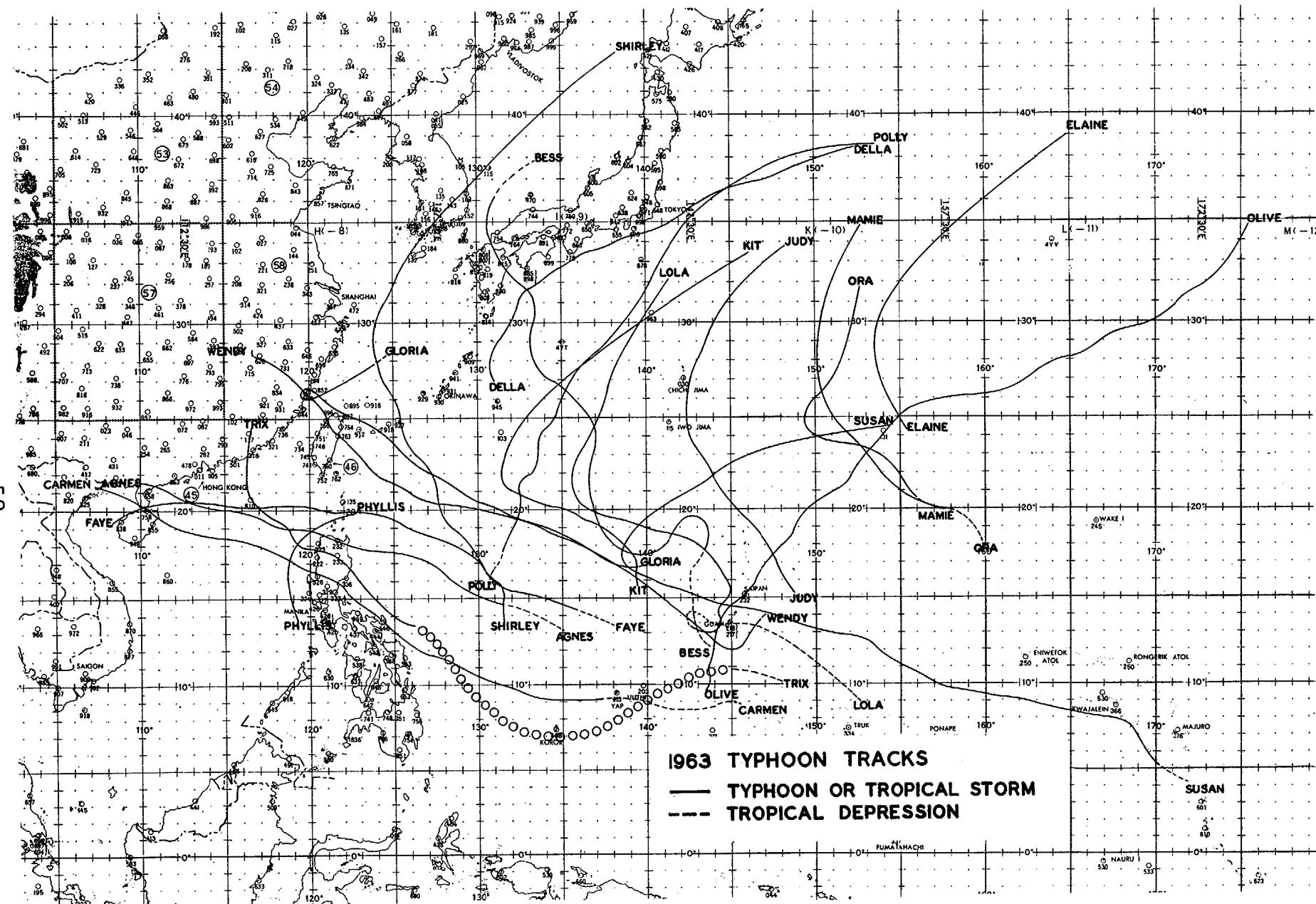
<u>TYPHOON</u>	<u>MONTH</u>	<u>MAX SFC WND SPD</u>	<u>CALENDAR DAYS OF WARNINGS/TYPHOON</u>		<u>DISTANCE TRAVELED</u>
			WARNINGS	TYPHOON	<u>WARNING STATUS</u>
OLIVE	APR	125	9.50	8.50	2436
POLLY	MAY	70	6.00	3.25	1950
SHIRLEY	JUN	140	7.75	6.50	2148
TRIX	JUN	70	6.25	2.00	1146
WENDY	JUL	135	9.25	6.25	2100
AGNES	JUL	85	5.50	3.00	1554
BESS	JUL	130	15.25	6.50	2244
CARMEN	AUG	125	9.75	5.75	2430
DELLA	AUG	100	5.75	4.00	1410
ELAINE	AUG	100	3.50	2.25	1128
FAYE	SEP	110	7.50	5.25	1812
GLORIA	SEP	135	9.00	5.75	1638
JUDY	SEP	150	5.00	4.25	1326
KIT	OCT	135	6.75	5.25	1674
LOLA	OCT	130	11.75	5.25	2376
MAMIE	OCT	100	3.50	3.00	1116
ORA	OCT	80	6.25	2.25	1194
PHYLLIS	DEC	75	2.00	1.25	486
SUSAN	DEC	135	10.50	8.00	3204
TYPHOON	AVG	112	7.41	4.65	1756

1963 TYPHOON DATA SUMMARY

TYPHOON	MONTH	MAX RAD SFC CIRC	FROM RECONNAISSANCE		
			MAX 700 MB TEMP (C)	MIN 700 MB HGT	MIN SLP (MB)
OLIVE	APR	450	21	2400	922
POLLY	MAY	450	15	2896	980
SHIRLEY	JUN	300	21	2493	935
TRIX	JUN	250	16	2890	980
WENDY	JUL	350	21	2441	928
AGNES	JUL	250	15	2970	992
BESS	JUL	350	21	2475	930
CARMEN	AUG	250	23	2539	936
DELLA	AUG	250	22	2847	970
ELAINE	AUG	250	15	2768	967
FAYE	SEP	450	17	2722	957
GLORIA	SEP	550	19	2384	921
JUDY	SEP	400	24	2341	917
KIT	OCT	700	19	2451	929
LOLA	OCT	300	19	2609	945
MAMIE	OCT	500	21	2819	971
ORA	OCT	300	19	2929	984
PHYLLIS	DEC	210	15	2940	986
SUSAN	DEC	500	21	2478	932
TYPHOON	AVG	372	19	2652	952

1963 TYPHOON DATA SUMMARY

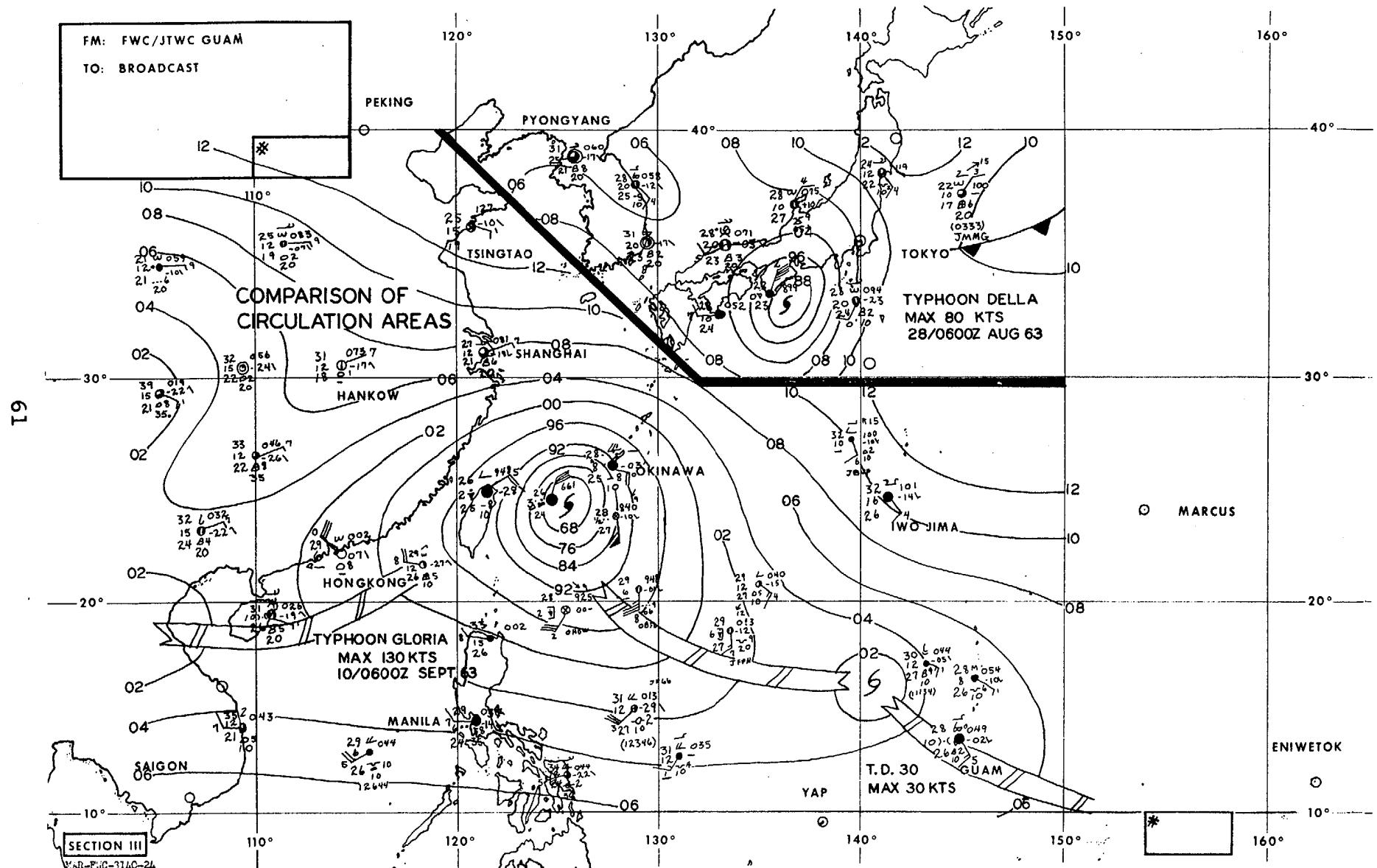
<u>TYPHOON</u>	<u>MONTH</u>	FROM WARNINGS		
		MAX RADIUS 100 KT WND	MAX RADIUS 50 KT WND	MAX RADIUS 30 KT WND
OLIVE	APR	40	125	450
POLLY	MAY	--	200	350
SHIRLEY	JUN	75	200	300
TRIX	JUN	--	100	250
WENDY	JUL	80	200	350
AGNES	JUL	--	100	250
BESS	JUL	30	200	350
CARMEN	AUG	40	150	250
DELLA	AUG	15	75	250
ELAINE	AUG	30	150	250
FAYE	SEP	40	125	450
GLORIA	SEP	90	250	550
JUDY	SEP	100	225	400
KIT	OCT	70	250	850
LOLA	OCT	70	200	600
MAMIE	OCT	--	150	500
ORA	OCT	--	150	300
PHYLLIS	DEC	--	50	250
SUSAN	DEC	60	225	450

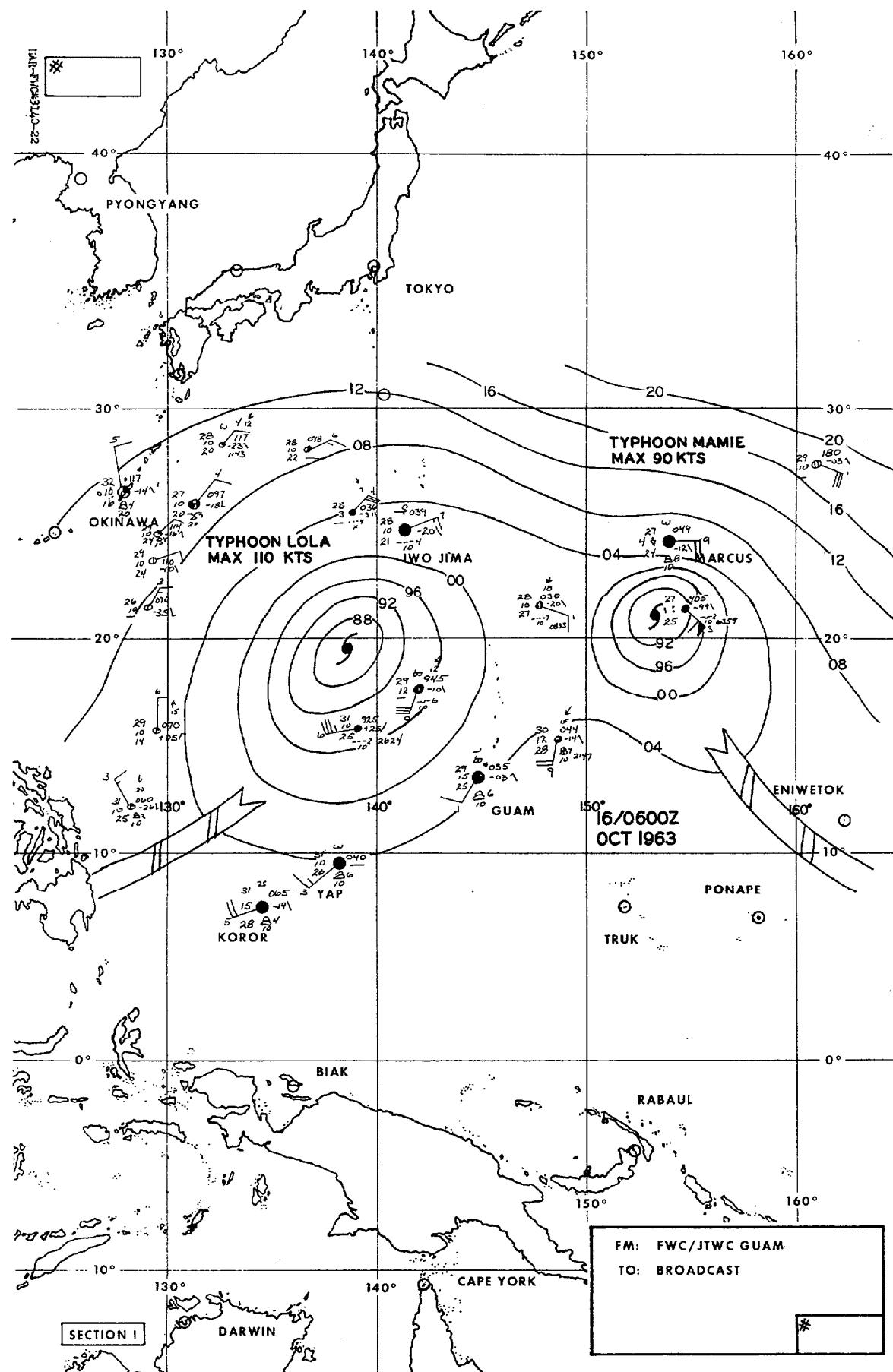


1963 TYPHOON TRACKS

TYPHOON OLIVE	27 APR - 06 MAY
TYPHOON POLLY	31 MAY - 06 JUN
TYPHOON SHIRLEY	13 JUN - 20 JUN
TYPHOON TRIX	18 JUN - 19 JUN
TYPHOON WENDY	26 JUN - 01 JUL
	09 JUL - 18 JUL
TYPHOON AGNES	17 JUL - 22 JUL
TYPHOON BESS	27 JUL - 11 AUG
TYPHOON CARMEN	07 AUG - 17 AUG
TYPHOON DELLA	25 AUG - 30 AUG
TYPHOON ELAINE	25 AUG - 28 AUG
TYPHOON FAYE	01 SEP - 08 SEP
TYPHOON GLORIA	05 SEP - 14 SEP
TYPHOON JUDY	30 SEP - 04 OCT
TYPHOON KIT	05 OCT - 11 OCT
TYPHOON LOLA	08 OCT - 19 OCT
TYPHOON MAMIE	15 OCT - 18 OCT
TYPHOON ORA	23 OCT - 29 OCT
TYPHOON PHYLLIS	12 DEC - 13 DEC
TYPHOON SUSAN	18 DEC - 28 DEC

<u>TYPHOON DISTRIBUTION BY MONTH</u>													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOT
1952						3	1	3	3	5	3	3	21
1953		1			1	1	1	5	2	4	1	1	17
1954					1		1	4	4	2	3		15
1955	1		1	1		1	5	3	3	2	1	1	19
1956			1	1			2	4	5	1	3	1	18
1957	1			1	1	1	1	2	5	3	3		18
1958	1				1	2	5	3	3	3	1	1	20
1959					1		1	5	3	3	2	2	17
1960					1	2	2	8		4	1	1	19
1961				1	2	1	3	3	5	3	1	1	20
1962					1	2	5	7	2	4	3		24
<u>1963</u>					1	1	2	3	3	4	2		<u>19</u>
AVG.	.25	.08	.25	.6	.75	1.1	2.5	4.2	3.2	3.2	1.8	1.1	18.9





TROPICAL CYCLONES OF 1963

CYCLONE	*PERIOD
03. Tropical Depression 03	25 MAR - 26 MAR
04. Investigation	30 MAR - 03 APR
05. Typhoon OLIVE	27 APR - 06 MAY
07. Investigation	19 MAY - 21 MAY
08. Investigation	20 MAY - 21 MAY
09. Typhoon POLLY	31 MAY - 06 JUN
10. Tropical Storm ROSE	08 JUN - 13 JUN
11. Typhoon SHIRLEY	13 JUN - 20 JUN
12. Typhoon TRIX	18 JUN - 19 JUN
	26 JUN - 01 JUL
15. Tropical Storm VIRGINIA	04 JUL - 09 JUL
16. Typhoon WENDY	09 JUL - 18 JUL
17. Investigation	12 JUL - 13 JUL
18. Typhoon AGNES	17 JUL - 22 JUL
19. Tropical Depression 19**	26 JUL - 29 JUL
20. Typhoon BESS	27 JUL - 11 AUG
21. Tropical Depression 21	29 JUL - 30 JUL
23. Typhoon CARMEN	07 AUG - 17 AUG
25. Typhoon DELLA	25 AUG - 30 AUG
26. Tropical Depression 26	26 AUG - 27 AUG
27. Typhoon ELAINE	25 AUG - 28 AUG
28. Typhoon FAYE	01 SEP - 08 SEP
29. Typhoon GLORIA	05 SEP - 14 SEP
30. Tropical Storm HESTER	08 SEP - 12 SEP
31. Tropical Depression 31***	16 SEP - 20 SEP
32. Tropical Storm IRMA	17 SEP - 19 SEP
34. Typhoon JUDY	30 SEP - 04 OCT
35. Typhoon KIT	05 OCT - 11 OCT
36. Typhoon LOLA	08 OCT - 19 OCT
37. Typhoon MAMIE	15 OCT - 18 OCT
38. Tropical Storm NINA	18 OCT - 19 OCT

TROPICAL CYCLONES OF 1963 (CONT'D)

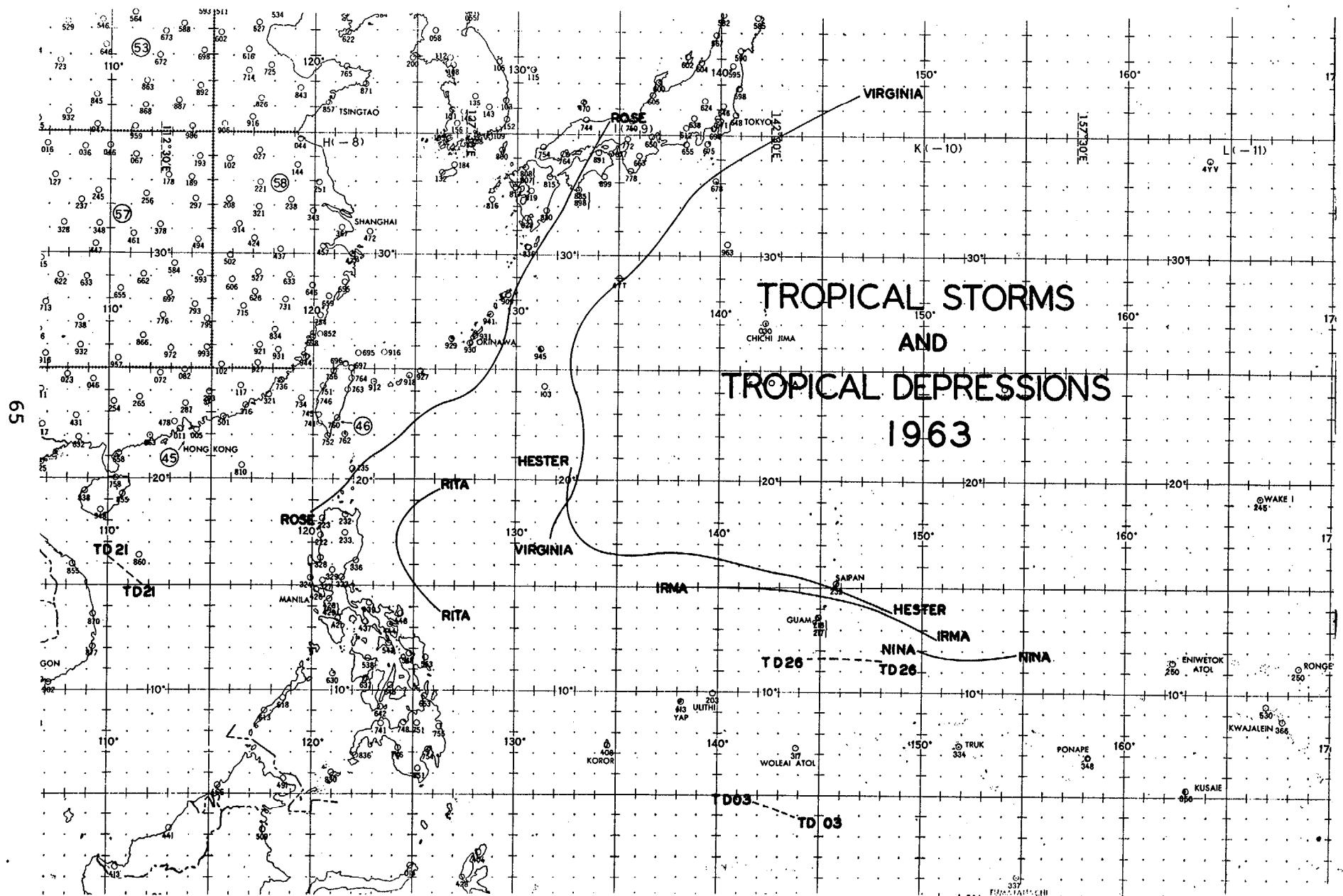
CYCLONE	*PERIOD
39. Typhoon ORA	23 OCT - 29 OCT
40. Investigation	01 DEC - 02 DEC
41. Typhoon PHYLLIS	12 DEC - 13 DEC
42. Tropical Storm RITA	16 DEC - 18 DEC
43. Typhoon SUSAN	18 DEC - 28 DEC

* The period shown covers the period from the date the cyclone was first assigned a cyclone number until the final warning was issued, or if no warnings were issued, the date the cyclone dissipated.

** JHWC Hawaii

*** JHWC Hawaii (Cyclone 09 for FWC Alameda)

Note: The missing numbers were assigned to major easterly waves that did not reach the cyclone stage.



TROPICAL STORMS AND TROPICAL DEPRESSIONS 1963

TROPICAL STORMS 1963
POSITION DATA

TROPICAL STORM ROSE
08 JUN-13 JUN

DTG	LAT	LONG	DTG	LAT	LONG
080000Z	18.5N	119.8E	110000Z	22.9N	125.3E
080600Z	18.7N	120.1E	110600Z	23.4N	126.1E
081200Z	18.8N	120.5E	111200Z	23.5N	126.7E
081800Z	19.0N	120.8E	111800Z	23.7N	127.3E
090000Z	19.3N	121.0E	120000Z	23.9N	127.6E
090600Z	19.6N	121.3E	120600Z	24.4N	127.9E
091200Z	19.9N	121.7E	121200Z	25.0N	128.7E
091800Z	20.4N	122.1E	121800Z	26.3N	129.5E
100000Z	20.9N	122.6E	130000Z	28.0N	129.8E
100600Z	21.4N	123.4E	130600Z	29.9N	130.9E
101200Z	21.8N	124.1E	131200Z	32.3N	132.5E
101800Z	22.4N	124.7E	131800Z	35.5N	134.5E

TROPICAL STORM VIRGINIA
04 JUL-09 JUL

DTG	LAT	LONG	DTG	LAT	LONG
040600Z	17.2N	131.8E	070000Z	24.4N	132.9E
041200Z	17.8N	131.9E	070600Z	25.1N	132.9E
041800Z	18.3N	132.2E	071200Z	25.8N	132.9E
050000Z	18.9N	132.5E	071800Z	26.5N	133.0E
050600Z	19.6N	132.8E	080000Z	27.1N	133.3E
051200Z	20.3N	133.0E	080600Z	27.7N	133.7E
051800Z	20.9N	133.2E	081200Z	28.4N	134.4E
060000Z	21.6N	133.2E	081800Z	30.2N	136.3E
060600Z	22.3N	133.3E	090000Z	32.9N	139.0E
061200Z	23.0N	133.2E	090600Z	34.9N	142.8E
061800Z	23.7N	133.1E	091200Z	36.5N	146.8E

TROPICAL STORM HESTER
08 SEP-12 SEP

DTG	LAT	LONG	DTG	LAT	LONG
081200Z	13.8N	148.4E	090000Z	14.5N	146.5E
081800Z	14.2N	147.5E	090600Z	14.9N	145.5E

(continued)

TROPICAL STORM HESTER (CONT'D)
08 SEP-12 SEP

DTG	LAT	LONG	DTG	LAT	LONG
091200Z	15.3N	144.5E	110000Z	16.2N	139.9E
091800Z	15.6N	143.5E	110600Z	16.3N	138.8E
100000Z	15.8N	142.5E	111200Z	16.3N	136.7E
100600Z	15.9N	141.7E	111800Z	16.9N	134.3E
101200Z	16.0N	141.1E	120000Z	19.1N	132.7E
101800Z	16.1N	140.6E	120600Z	21.6N	132.8E

TROPICAL STORM IRMA
17 SEP-19 SEP

DTG	LAT	LONG	DTG	LAT	LONG
170600Z	12.5N	150.7E	181200Z	14.8N	143.9E
171200Z	13.2N	149.5E	181800Z	15.0N	142.1E
171800Z	13.7N	148.3E	190000Z	15.0N	140.2E
180000Z	14.1N	147.0E	190600Z	15.0N	138.3E
180600Z	14.5N	145.6E			

TROPICAL STORM NINA
18 OCT-19 OCT

DTG	LAT	LONG	DTG	LAT	LONG
180600Z	11.8N	154.7E	190600Z	11.8N	151.2E
181200Z	11.6N	153.5E	191200Z	11.8N	150.5E
181800Z	11.6N	152.5E	191800Z	12.0N	149.8E
190000Z	11.6N	151.8E			

TROPICAL STORM RITA
16 DEC-18 DEC

DTG	LAT	LONG	DTG	LAT	LONG
160600Z	13.8N	126.2E	171200Z	17.5N	124.2E
161200Z	14.5N	125.5E	171800Z	18.1N	124.4E
161800Z	15.1N	124.9E	180000Z	18.6N	124.8E
170000Z	15.8N	124.4E	180600Z	19.1N	125.3E
170600Z	16.5N	124.1E	181200Z	19.5N	126.2E

TROPICAL DEPRESSIONS 1963
POSITION DATA

TROPICAL DEPRESSION ZERO THREE
25 MAR-26 MAR

DTG	LAT	LONG	DTG	LAT	LONG
250600Z	03.9N	149.3E	251800Z	04.4N	147.7E
251200Z	04.2N	148.5E	260000Z	04.6N	146.9E

TROPICAL DEPRESSION TWO ONE
29 JUL-30 JUL

DTG	LAT	LONG	DTG	LAT	LONG
291800Z	15.0N	111.5E	300600Z	15.8N	110.5E
300000Z	15.4N	111.1E	301200Z	16.3N	110.0E

TROPICAL DEPRESSION TWO SIX
26 AUG-27 AUG

DTG	LAT	LONG	DTG	LAT	LONG
260600Z	11.5N	148.0E	261800Z	11.6N	145.5E
261200Z	11.6N	146.7E	270000Z	11.6N	144.2E

POSITION DATA FOR TROPICAL DEPRESSION WARNINGS ISSUED BY
JOINT HURRICANE WARNING CENTER, HAWAII

TROPICAL DEPRESSION ONE NINE
26 JUL-29 JUL

DTG	LAT	LONG	DTG	LAT	LONG
260000Z	06.0N	163.0W	271800Z	06.0N	172.2W
260600Z	06.0N	164.0W	280000Z	06.0N	173.3W
261200Z	06.0N	165.3W	280600Z	06.0N	174.5W
261800Z	06.0N	167.3W	281200Z	06.0N	175.7W
270000Z	06.0N	168.5W	281800Z	06.0N	176.7W
270600Z	06.0N	169.6W	290000Z	06.0N	177.9W
271200Z	06.0N	170.6W			

TROPICAL DEPRESSION THREE ONE*

16 SEP-20 SEP

DTG	LAT	LONG	DTG	LAT	LONG
160900Z	23.7N	150.7W	180900Z	19.8N	162.2W
161500Z	23.2N	152.3W	181500Z	19.5N	163.5W
162100Z	23.0N	154.1W	182100Z	19.0N	167.0W
170300Z	23.2N	155.7W	190300Z	20.0N	166.0W
170900Z	22.2N	157.0W	190900Z	20.0N	167.3W
171500Z	20.8N	158.3W	191500Z	20.0N	169.2W
172100Z	20.4N	159.6W	192100Z	20.0N	174.0W
180300Z	20.2N	161.0W	200300Z	19.0N	179.0W

*Cyclone 09 for FWC Alameda